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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,899	12/10/2003	Keiji Takizawa	9319S-000590	6881
27572	7590	06/02/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			QI, ZHI QIANG	
P.O. BOX 828			ART UNIT	
BLOOMFIELD HILLS, MI 48303			PAPER NUMBER	
			2871	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/732,899	<b>Applicant(s)</b> TAKIZAWA ET AL.	
	<b>Examiner</b> Mike Qi	<b>Art Unit</b> 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/13/04:12/10/03</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

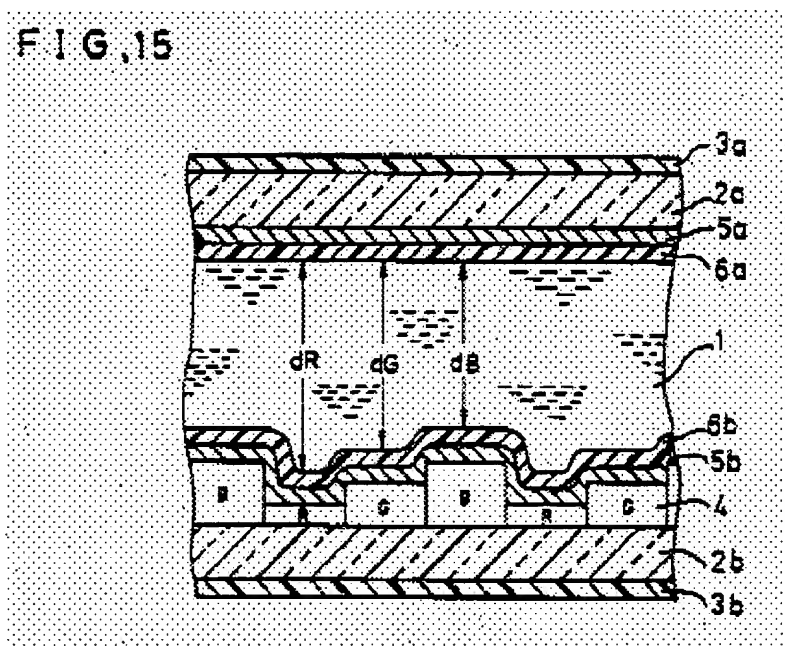
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 6-9 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,632,514 (Ogawa et al) in view of US 6,271,902 B1 (Ogura et al).

Claims 1-3, 7-9 and 13-14, Ogawa discloses (col.9, line 48 – col.10, line 26; Fig.15) that a liquid crystal display device (electro-optical device) having a color filter substrate and the color substrate comprising:

- a substrate (2b);
- a first colored layer (such as G color filter) in a first region of the substrate, and forming a first colored step as shown in Fig.15;
- a second colored layer (such as B color filter) in a second region of the substrate, and forming a second coloring step as shown in Fig.15;
- the first colored layer (such as G color filter) and the second colored layer (such as B color filter) are disposed adjacent to each other;
- a surface of the second region (such as the surface of the B color filter) is higher than a surface of the first region (such as the surface of the G color filter), and there is a step difference plane (such as a portion of the conductive

film 5b between the two color filters being formed as a step difference plane), and that is between the first region and the second region.

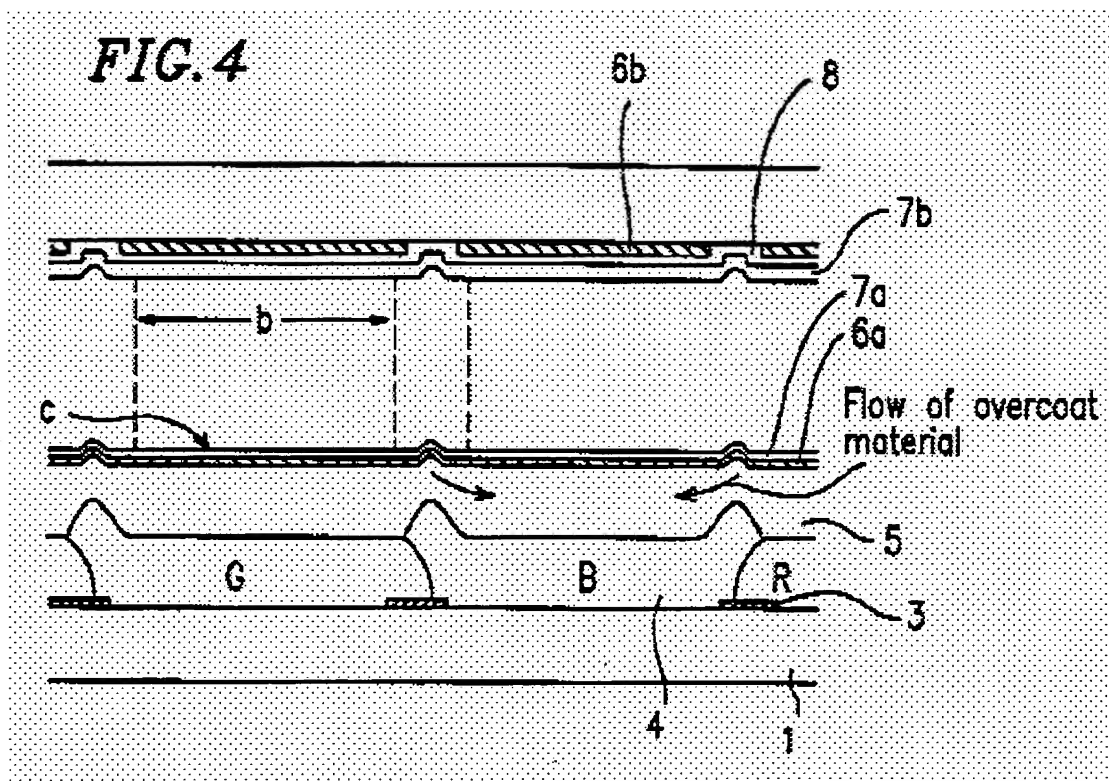


Ogawa does not explicitly disclose that forming an interface portion or forming a step difference plane in a region, i.e., forming the interface portion between the first colored layer and the second colored layer in a region toward the second region from the bottom portion of the step difference plane or forming the bottom portion of the step difference plane in a region toward the first colored layer from the interface portion between the first colored layer and the second colored layer; and that also is the color filters overlapped each other and having a protrusion on a surface of the interface portion as claimed in the claims.

However, Ogura discloses (col.12, line 61 – col.13, line 33; Fig.4) that the edge portions of the adjacent coloring layers (4) are overlapped with each other, and the edge portions of the coloring layer (4) form convex portions (protrusion) in the

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overlapped portions. Because the protrusion is formed between the two coloring layers, and that combined with the reference Ogawa, the interface portion between the two colored layers would be formed in a region toward the second region, such as the B colored region, from the bottom of the step difference plane (a portion of the conductive film 5b of the Ogawa, and that is inclined plane); and the bottom portion of the step difference plane, such as the bottom portion of a portion of the conductive layer (5b) in the Fig.15 of Ogawa, would be formed in a region toward the first colored layer, such as the G colored region, from the interface portion between the two colored layers.



Ogura also discloses (col.9, line 62 – col.10, line 8) that the overlapped portion of the coloring layer forms a convex portion (protrusion), and that the convex portion (protrusion) plays a bank role and allows the overcoat material (the overcoat layer

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functions as a protection film) to flow toward the center of the pixel to smooth the surface of the pixel portion so as to improve the surface smoothness of the pixel portion. Ogura also indicates (col.10, line 65 – col.11, line 2) that the improvement of the surface smoothness of a color filter substrate is a very critical matter for ameliorating and improving the optical characteristics as well as display quality of a color liquid crystal display device.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the two colored layers overlapped each other on the interface portion and a protrusion is provided on the surface of the interface portion between the two colored layers as claimed in claims 1-3, 7-9 and 13-14 for improving the surface smoothness of the pixel portion so as to improve the optical characteristics as well as display quality of a color liquid crystal display device.

Claim 6, Ogawa discloses (Fig.15) that a conductive film (5b) functions as an electrode integrally formed on a surface extending from the first region (such as G colored region) via the step difference plane (such as a portion of the conductive layer 5b between the two colored regions) to the second region (such as the B colored region).

Claims 11-12 and 15, Ogawa discloses (Fig.15) that a liquid crystal display device (electro-optical device) comprising a liquid crystal (1) (electro-optical material), a color filter substrate (2b), and the thickness of the liquid crystal layer in the first region such as the G colored region (dG) being thicker than the liquid crystal layer in the second region such as the B colored region (dB), and that is corresponding to the height

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difference between the two regions in the color filter substrate (2b). Ogawa also discloses (col.2, lines 52 – 63; Fug.4) that by impressing a voltage above the threshold voltage (that is controlled by a switching element such as thin film transistor TFT) across the conductive films (5s, 5b), the molecular alignment of the liquid crystal is changed, so as to modulate light passing through the liquid crystal cell, so that applying an electric field to the liquid crystal (electro-optical material), and that is a conventional and basic principle of color liquid crystal display apparatus, and that would have been at least obvious.

3. Claims 4-5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa and Ogura as applied to claims 1-3, 6-9 and 11-15 above, and further in view of US 6,501,521 B2 (Matsushita et al).

Claims 4-5 and 10, lacking limitation is such that a light transmission portion is provide in the first region (transmission region), and a light reflection portion having reflection layer is provided in the second region (reflection region), and the light reflection portion including the interface portion (between the two colored regions); and the light reflection layer having opening in the first region (transmission region) is formed to cover the interface portion (between the two colored regions).

However, Matsushita discloses (col.7, line 56 – col.8, line 43; Figs.1-2) that a liquid crystal display device having a light transmission region (Tr) and a light reflection region (Re), and a light reflection film (11) having light-transmitting through hole portion (21) as the opening of the reflection film (11) under the color filter (10), i.e., a light transmission portion (Tr) enables light to be transmitted is provided in the first region

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(transmission region), and a light reflection portion (Re) having a light reflection layer (11) is provided in the second region (reflection region), and the reflection film (11) covers the interface portion (between the two color filters, such as between color filter B and color filter G), so that is the light reflection layer covers the interface portion (between the two color filters) and the light reflection portion having the interface portion (between the two color filters). Matsushita also discloses (col.6, lines 20-54) that with such a liquid crystal display device, it is possible to realize a reflection color display with a desirable color reproducibility and also to realize a transmission color display with a desirable color reproducibility.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a light reflection layer having opening is formed, and the light reflection layer covers the interface portion (between the two color filters) so as to form a light transmission region and a light reflection region as claimed in claims 4-5 and 10 for achieving a reflection color display with a desirable color reproducibility and also achieving a transmission color display with a desirable color reproducibility.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Mike Qi*

Mike Qi  
Patent Examiner  
May 19, 2005